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FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEY and WATER SUPPLY FORECASTS for

MONTANA & NORTHERN WYOMING

UNITED STATES DEPARTMENT of AGRICULTURE...SOIL CONSERVATION SERVICE.

and

MONTANA AGRICULTURAL EXPERIMENT STATION

In cooperation with the U.S. Forest Service, U.S. Geological Survey, National Park Service, U.S. Bureau of Reclamation, State Engineers of Montana and Wyoming and other Federal, State and private organizations.

MAY 1, 1959

UNITED STATES DEPARTMENT OF AGRICULTURE - SOIL CONSERVATION SERVICE

TO RECIPIENTS OF COOPERATIVE SNOW SURVEY AND WATER SUPPLY FORECAST REPORTS:

The climate of the cultivated and populated areas of the West is characterized by relatively dry summer months. Such precipitation as occurs falls mostly in the winter and early spring months when it is of little immediate benefit to growing crops. Fortunately, most of this precipitation falls as mountain snow which stays on the ground for months, melting later to sustain streamflow during the period of greatest demand during late spring and summer. Thus, nature provides in mountain snow an imposing water storage facility.

The amount of water stored in mountain snow varies from place to place as well as from year to year and accordingly, so does the runoff of the streams. The best seasonal management of variable western water supplies results from fore-knowledge of the runoff.

A snow survey consists of a series of about ten samples taken with specially designed snow sampling equipment along a permanently marked line, about 1000 feet in length, called a snow course. The use of snow sampling equipment provides snow depth and water equivalent values for each sampling point. The average of these values is reported as the snow survey measurement for a snow course.

Snow surveys are made monthly or semi-monthly beginning in January or February and continue through the snow season until April, May or June. Currently more than 1300 western snow courses are measured each year. These measurements furnish the key data for water supply forecasts.

By relating snow survey measurements taken over a period of years to spring-summer runoff during the same period, relationships have been developed which make it possible to forecast seasonal runoff several months in advance of occurrence. In order to make a forecast, once a forecast relationship has been developed, the maximum snow water content at previously selected key snow courses is usually entered in the forecast relationship. More accurate forecasts are often obtained when other factors such as soil moisture, base flow and spring precipitation are considered and included in the forecast relationships.

Listed below are the Federal-State-Private Cooperative Snow Survey and Water Supply Forecast reports available for the West which contain detailed information on snow survey measurements, streamflow forecasts, reservoir storage, soil moisture and other guide data to water management and conservation decisions.

PUBLISHED BY SOIL CONSERVATION SERVICE

REPORTS	ISSUED	COOPER	ATING WITH	LOCATION
RIVER BASINS COLORADO, RIO GRANDE	Monthly (FebMay)	Colo. STA	STATIONF TE ENGINEER O STATE ENGINEER	T. Collins. Colo.
COLUMBIA Includes Alaska	MONTHLY (JANMAY)	IDAHO STA	ATE ENGINEER	BOISE. IDAHO
Upper Missouri	MONTHLY (FEB MAY)	Mont.Agr.	EXP.STATION	BOZEMAN, MONTANA
WEST-WIDE	(OCT. 1. APR. 1 AND MAY 1)	COOPERATO	RS	Portland. Oregon
STATES				
ARIZONA	SEMI-MONTHLY			PHOENIX. ARIZONA
NE VA DA	MONTHLY (FEBAPR.)	NEVADA ST	ATE ENGINEER	RENO. NEVADA
Ore gon	MONTHLY (JANMAY)	ORE.AGR.E	XP.STATION	PORTLAND. OREGON
UTAH	(YAMNAL)	UTAH STAT UTAH AGR.	E ENGINEER Exp.StationSa	LT LAKE CITY, UTAH
WASHINGTON	MONTHLY (FEBMAY)	Wash. Sta	TE DEPT. VATIONSp	OKANE. WASHINGTON
WYOMING	Monthly (FebJune)	WYOMING S	TATE ENGINEER	CASPER, WYOMING
Copies of the	e various reports may be s	ecured from:	Head, Water Supply For Soil Conservation Serv 209 S.W. 5th Avenue, F	vice

PUBLISHED BY OTHER AGENCIES

OTHER	SNOW SURVEY	REPORTS						
BRI	TISH COLUMBIA		. MONTHLY	(FEBJUNE)	COMPTROLLER. AND FORESTS.			
CAL	1FORN1A	• • • • • • • • • • • • • • • • • • • •	. MONTHLY	(FEBMAY)		LA DEPARTMENT	er Resou	RCES.

FEDERAL-STATE-PRIVATE COOPERATIVE

SNOW SURVEYS and WATER SUPPLY FORECASTS

for

MONTANA AND NORTHERN WYOMING

(Upper Missouri and Upper Columbia River Basins)

Report Prepared by:

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TABLE OF CONTENTS

	age
STATE OF MONTANA Water Supply Outlook	1
MISSOURI RIVER BASIN	2
COLUMBIA RIVER BASIN	3
Lower Yellowstone River (Wyoming)	-5 6 7-8
SOIL MOISTURE COMPARISONS	9
MONTANA SNOW SURVEYS & COMPARISONS Jefferson, Madison, Gallatin Missouri Main Stem, Upper Yellowstone Rivers	10 11
WYOMING SNOW SURVEYS & COMPARISONS Lower Yellowstone Tributaries	13
MONTANA SNOW SURVEYS & COMPARISONS Kootenai River	14 14 15 15
South Dakota	16 16 17 17
SNOW COURSE & RIVER BASIN MAP Montana and Northern Wyoming	
LIST OF COOPERATORS Inside Back Cov	70%



WATER SUPPLY OUTLOOK FOR MONTANA May 1, 1959

The 1959 Water Supply Outlook for the State of Montana is GOOD. The only apparent shortage is in the extreme southern end of the Beaverhead River, where a 75 percent normal supply is forecast.

The Sun River inflow to Gibson Reservoir is forecast at 159 percent average or 912,000 acre feet for the April-September period. Stations along the Missouri and Yellowstone Rivers are forecast for near normal flows this season.

The Blackfoot River near Bonner, the Swan River at Big Fork, and the Clark Fork River above Missoula are forecast to have extremely high flows from the record snow-pack in the mountains feeding these streams.

The April-September flow of the Clark Fork is forecast at 135 percent average below Missoula; a decrease to 125 percent average is forecast at Plains and Thompson Falls.

For May first, irrigation and hydro-electric reservoirs are at satisfactory levels to receive the anticipated spring runoff from the winter snow-pack.

In the Flathead basin, soil moisture under the snow-pack is, in general, slightly higher than last season.

At Bozeman, soil moisture is one-half inch less than last season.



MISSOURI RIVER BASIN

JEFFERSON RIVER:

The Red Rock portion of the Beaverhead River is forecast to flow 25 percent below average this season. This is the only apparent shortage in the State. April precipitation was only 27 percent of normal at Lima and snow cover on April first was 25 percent below average. The tributaries to the Beaverhead River between Armstead and Barratts are forecast to cover the apparent shortage. The April-July flow at Barratts on the Beaverhead is forecast to be 94 percent average or 126,000 acre feet.

MADISON RIVER:

May first snow surveys on the Madison River indicate that an aboveaverage snow-pack exists at high elevations; low elevation snow-pack is below average or non existent. This could mean a prolonged runoff period.

GALLATIN RIVER:

Snow surveys made on May first indicate an above-average water supply for this river this season. The snow course at Devil's Slide, elevation 8,100 feet, showed 30.6 inches water content. This measurement is only one inch less than the record high of 31.6 water content measurement made in 1948.

MISSOURI RIVER MAIN STEM:

May first snow surveys on the tributaries to the Missouri between Toston and Fort Benton indicate an above-average snow-pack for this late in the season. Record high measurements at Kings Hill, Stemple Pass and Upper Tenmile Creek snow courses could produce local high water and a prolonged seasonal runoff.

UPPER YELLOWSTONE RIVER, MONTANA

May first snow surveys at a few key stations indicate a GOOD water supply outlook for the Yellowstone River and tributary streams from Gardiner to Livingston. The Yellowstone River is forecast to flow 99 percent average and 26 percent greater than last season. There was a normal decline of snow water content during April.

SHIELDS RIVER BASIN:

Although no snow surveys are made on May first in this basin, precipitation has been close to average at most stations. The April forecasts have not been lowered. The Shields River and tributaries should produce about 9 percent more water than last season and 90 percent of the average year.



COLUMBIA RIVER BASIN

FLATHEAD RIVER:

May first snow surveys indicate an above-average snow-pack this season. A heavy snow-pack of record proportions exists on the high elevation snow courses on the Mission and Swan mountains. Record water content measurements exist at Big Creek, east of Polson; North Fork Jocko, east of St. Ignatius; Trinkus Lake, Upper Holland Lake and Strawberry Lake on the Swan Range; and on Big Mountain, north of Kalispell. This heavy snow-pack is likely to cause extremely high water in the streams being fed from this area. The snow-pack on these courses is greater than it was in 1950.

The Flathead River at Columbia Falls is forecast to flow 117 percent average or 6,502,000 acre feet from April 1 through September 30. The South Fork of the Flathead River is forecast to flow 2,404,000 acre feet for the April-September period, with 2,034,000 acre feet during April, May and June. These figures are 117 percent of the average.

CLARK FORK RIVER:

The upper portion of the Clark Fork River, from Butte to Milltown, has a good snow-pack this season. All courses measured about May first were above average. The Clark Fork River above Bonner is forecast to flow 117 percent average this season.

The Blackfoot basin, to the north of the Clark Fork, has a heavy snow-pack at the higher elevations. May first snow survey measurements show record highs, exceeding 1950 by 4 inches of water content. This heavy snow-pack is certain to bring high spring flows during June and July. The Blackfoot River at Bonner is forecast at 169 percent average or 1,363,000 acre feet of water during the April-July period. This flow will enter the Clark Fork River above Missoula with a forecast of 151 percent average flow for the April-July period or 2,160,000 acre feet.

The Bitterroot River basin will produce only 107 percent of the average flow during the runoff season.



The following summarized runoff forecasts are based principally on mountain snow cover and on the assumption that precipitation and temperature during the forecast period will be near average. Appreciable deviations from normal of temperature and/or precipitation during the forecast period will correspondingly modify these forecasts.

JPPER MISSOURI RIVER		FORECAST	%	FORE-			1938-5
IN MONTANA		RUNOFF	15-Yr.	CAST	Measured	Average	
IN MONIANA		HONOLL	AVG.	PERIOD -	1957##	1956	_ wacras
			41100	2 2312 02	-///	-//-	1
ED ROCK RIVER							
Monida (near) (1)	<i>#</i> 5	61	75	Apr-Sept	104	60	81
		57	75	Apr-July	100	58	76
EAVERHEAD RIVER						1	
Barratts (at)	#9	166	94	Apr-Sept	204	155	177
		126	94	Apr-July	162	122	134
IG HOLE RIVER						1	•
Melrose (near)	#85	631	85	Apr-Sept	720	842	745
		584	85	Apr-July	686	796	687
EFFERSON RIVER						1	
Sappington (at)	#14	879	83	Apr-Sept	1028	1045	1057
		780	83	Apr-July	964	967	938
ADISON RIVER							
West Yellowstone (near)	#104		93	Apr-Sept	220	255	198
		140	93 \	Apr-July	168	200	151
Grayling (near) (2)	#106	382	91	Apr-Sept	454	488	420
(Net inflow to Hebgen Lk)	,,	302	91	Apr-July	361	402	333
McAllister (near) (3)	#109	661	91	Apr-July	750	802	726
		533	91	Apr-July	615	672	585
ALLATIN RIVER					To or the second	- opening in the contract of t	
Gateway (near)	#114	487	110	Apr-Sept	469	499	445
		420	109	Apr-July	406	443	384
Logan (at)	#116	539	112	Apr-Sept	446	512	478
		462	112	Apr-July	386	452	410
Hyalite Cr. R.S. (at)(7)	#118		114	Apr-Sept	34	29	35
		34	114	Apr-July	30	25	30
IISSOURI RIVER	//=						
Toston (at) (3)	#15	2075	82	Apr-Sept	2187	2345	2535*
	110.00	1756	81	Apr-July	1956	2098	2191*
Fort Benton (at) (4)	#25	3335	99	Apr-Sept	3032	3131	3381
77.	110/	2812	98	Apr-July	2608	2722	2874
Virgelle (at) (4)	#26	4098	102	Apr-Sept	3500	3261	4013
(Loma)	//02	3499	102	Apr-July	3019	2806	3445
Zortman (near) (4)	#27	4481	103	Apr-Sept	3739	3588	4357
THE DOLL DOWN (1 7) (2)	//00	3814	102	Apr-July	3208	3076	3726
Ft.Peck Dam (below)(5)	#29	4396	101	Apr-Sept	3365	3290	4362
11:77: 4 37 5	//00	3809	102	Apr-July	2728	2613	3666
Williston, N. D.	#33	10913	92	Apr-Sept	11203	9673	11750
		9438	92	Apr-July	9527	8102	10228

⁽¹⁾ Observed flow plus change in storage in Lima Reservoir.

⁽²⁾ Observed flow plus change in storage in Hebgen Lake.
(3) Observed flow plus change in storage in Hebgen and Ennis Lakes.

 ⁽⁴⁾ Observed flow plus change in storage in Canyon Ferry.
 (5) Observed flow plus change in storage in Canyon Ferry and Ft. Peck Reservoirs.

⁽⁷⁾ Observed flow plus change in storage in Hyalite Reservoir.

^(*) Less than 15 years in 1938-52 period. Average for 15 yrs. nearest the base period. (##) Preliminary data furnished by U. S. Geological Survey, subject to correction.



HERE MICCOURT DIVER		Season: ORECAST	%	-Flow in T FORE-	1	02 1102 0	1938-52
UPPER MISSOURI RIVER IN MONTANA		RUNOFF	15-Yr. AVG.	CAST PERIOD	Measured Runoff 1957## 1956		Average
SUN RIVER Net Inflow to Gibson Reservoir	#1535	912 833	- 159 159	Apr-Sept	531 488	668	573* 524*
MARIAS RIVER Shelby (near)	#178	622 572	118 119	Apr-Sept	519 486	684 617	527 482
JUDITH RIVER Utica (near)	#208	48 44	121 121	Apr-Sept	29.2 27.6	18.4	39.8 36.3
MUSSELSHELL RIVER Delpine (near)	#216	8.2 6.7	120 120	Apr-Sept	6.0	4.8	6.8* 5.6*
YELLOWSTONE RIVER Corwin Springs (at)	#317	1792 1495	96 96	Apr-Sept Apr-July	1964 1643	2427 2099	1870 1556
Livingston (near)	#318	2038 1693	96 95	Apr-Sept Apr-July	2272 1902	2689 2322	2134 1770
Billings (at) Miles City (at)	#319	3659 3142 5842	91 91 92	Apr-Sept Apr-July Apr-Sept	5133 4521 7762	4788 4225 6175	4025 3446 6369
Sidney (near)	#326	5000 6054	92 91	Apr-July Apr-Sept	6764	5324	5421 6648
SHIELDS RIVER	//oox	5246	92	Apr-July	6735	5315	5724
Clyde Park (at) ROSEBUD RIVER	#335	95.4 88.8	90 91	Apr-Sept Apr-July	76.5 71.8	97.0	105.6 98.0
Absarokee (near)	#356	265 214	101 101	Apr-Sept Apr-July	372 321	251 208	263 212
STILLWATER RIVER Rosebud Cr. (above)	#3515	333 290	101 101	Apr-Sept Apr-July	463 413	343 321	331 288
Absarokee (near)	#352	596 501	100 100	Apr-Sept Apr-July	850 750	611 529	594 500
ROCK CREEK Red Lodge (near)	#365	107 82	100 100	Apr-Sept Apr-July	154 129	134	107 82
CLARK FORK RIVER Chance (at)	#360	599 536	103 104,	Apr-Sept Apr-July	715 649	716 660	580 5 1 7
Edgar (at)	#362	619 547	101 101	Apr-Sept Apr-July	785 706	773 698	614 539

^(##) Preliminary data furnished by U. S. Geological Survey, subject to correction.
(*) Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.



WYOMING STREAM-FLOW FORECASTS MAY 1, 1959 Prepared by SCS, Casper, Wyoming

Season	al Stream	-Flow in T	housands	of Acre I	Peet
FORECAST	%	FORE-			1938-52
RUNOFF	15-Yr.	CAST	Measured	Runoff	Average
	AVG.	PERIOD	1957	1956	
//	~~		3.00		
66	.77	Apr-Sept	123	96	86*
37.	70	Apr-Sent	62	11	49**
J4	70	Apr-Sept	O2	444	49
92	90	Apr-Sept	146	114	102**
	•	1			
780	95	Apr-Sept	1115	1014	823
	FORECAST RUNOFF 66 34	FORECAST % 15-Yr. AVG. 66 77 34 70 92 90	FORECAST % FORE-CAST PERIOD 66 77 Apr-Sept 34 70 Apr-Sept 92 90 Apr-Sept	FORECAST % FORE- CAST Measured 1957 66 77 Apr-Sept 123 34 70 Apr-Sept 62 92 90 Apr-Sept 146	RUNOFF 15-Yr. AVG. CAST PERIOD Measured Runoff 1957 1956 66 77 Apr-Sept 123 96 34 70 Apr-Sept 62 44 92 90 Apr-Sept 146 114

⁽¹⁾Observed flow corrected for storage in Buffalo Bill Reservoir and Hart Mountain Diversion.

^{*} Less than 15 years in 1938-52 period. Average for 15 years nearest the base period. **Estimated 1938-52 average.



		Seasona	al Stream	-Flow in T	housands	of Acre	Feet
UPPER COLUMBIA RIVER	•	FORECAST	%	FORE-			1938-52
IN MONTANA		RUNOFF	15-Yr.	CAST	Measured	Runoff	Average
			AVG.	PERIOD	1957##	1956	
CLARK FORK RIVER				-			
Bonner (above) (14)	#4155	905	117	Apr-Sept	655	880	771
Donner (above) (14)	π4エノノ	797	117		580	780	578
		683	117	Apr-July	522	1	
Microsola (aborra)	#/7 <i>E</i>			Apr-June		695	583
Missoula (above)	#415	2418	151	Apr-Sept	1577	2012	1602
		2160	151	Apr-July	1425	1817	1429
7 (1 7	// 1.00	1857	151	Apr-June	1292	1622	1229
Missoula (below)	#439	4023	135	Apr-Sept	2979	3960	2971
		3668	136	Apr-July	2764	3654	2700
		3213	137	Apr-June	2524	3290	2335
St. Regis (at)	#442	5398	137	Apr-Sept	4108	5749	3951
		4897	136	Apr-July	3787	5326	3588
		4339	139	Apr-June	3450	4817	3112
Plains (near) (15)	#503	13436	125	Apr-Sept	11159	15138	10747
		12268	125	Apr-July	10459	14070	9813
		10544	125	Apr-June	9527	12531	8434
Thompson Falls (at) (15)	#504	14345	125	Apr-Sept	11517	15920	11479
		13122	125	Apr-July	10820	14809	10500
		11258	125	Apr-June	9847	13188	9009
Cabinet Gorge (at)(15)	#507	15261	125	Apr-Sept			12211
		13980	125	Apr-July			11186
		11978	125	Apr-June			9584
BLACKFOOT RIVER							
Bonner (near)	#414	1513	169	Apr-Sept	922	1132	896**
, , , , , , , , , , , , , , , , , , , ,	и - ү ү	1363	168	Apr-July	844	1037	811**
		1174	169	Apr-June	769	927	693**
BITTERROOT RIVER		44.4		npi o airo	10))~1	0/3
Darby (near)	#422	557	106	Apr-Sept	515	740	525
202 0 (22001)	// 4~~	517	106	Apr-July	483	701	487
		452	105		1 1	649	
Missoula (near) (16)	#438	1605	117	Apr-June	441		429
ritasouta (Heat,) (10)	11470			Apr-Sept	1402	1948	1369
		1508	119	Apr-July	1340	1837	1270
		1356	123	Apr-June	1232	1668	1106

⁽¹⁴⁾ Difference in observed flow, Clark Fork above Missoula & Blackfoot at Bonner.

⁽¹⁵⁾ Observed flow plus change in storage in Flathead Lake & Hungry Horse Reservoir.

⁽¹⁶⁾ Difference in observed flow, Clark Fork above and below Missoula.

^(**) Average for period of record.

^(##) Preliminary data furnished by U. S. Geological Survey, subject to correction.



		Seasona	al Stream	-Flow in T	housands o	of Acre H	reet
UPPER COLUMBIA RIVER		FORECAST	%	FORE-		and the contraction of the contr	1938-52
IN MONTANA		RUNOFF	15-Yr.	CAST	Measured	Runoff	Average
		The Miles and the Control of the Con	and was trapped programming special CPT following the special party of t	PERIOD	1957##	1956	ho, arms navifilleri i njensod nazavazimo di Ancolosko (* 1
FLATHEAD RIVER							
Columbia Falls (near) #4	444	2020	117	Apr-Sept	1798	2308	1729
(North Fork)		1840	117	Apr-July	1681	2139	1575
· ·		1585	117	Apr-June	1523	1864	1350
Columbia Falls (at) (17) #4	4 58	6502	116	Apr-Sept	5716	7164	5619
	•	6061	116	Apr-July	5411	6720	5214
		5312	117	Apr-June	4962	5959	4530
Polson (near) (15) #4	469	7654	116	Apr-Sept	6525	8603	6612
		7120	116	Apr-July	6240	8082	6150
		6156	116	Apr-June	5715	7137	5317
MIDDLE FORK FLATHEAD		is, Americanismos Provincias que planestat no effertil d'Asse de los comition filonos compre d'Asse					
RIVER							
West Glacier (near) #4	450	1947	117	Apr-Sept	1764	2093	1659*
		1802	117	Apr-July	1672	1956	1540*
		1522	114	Apr-June	1524	1712	1330*
SOUTH FORK FLATHEAD							
RIVER							
Columbia Falls (near)(17) #4	¥57	2404	117	Apr-Sept	1976	2593	2058
(Net Inflow to Hungry		2283	117	Apr-July	1857	2488	1950
Horse Reservoir)		2034	118	Apr-June	1778	2279	1724
SWAN RIVER							
Big Fork (near) #4	466	910	156	Apr-Sept	575	750	584
		809	156	Apr-July	520	676	518
		674	157	Ap r-Jun e	451	581	427

period.

⁽¹⁵⁾ Observed flow plus change in storage in Flathead Lake & Hungry Horse Reservoir.
(17) Observed flow plus change in storage in Hungry Horse Reservoir.
(##) Preliminary data furnished by U. S. Geological Survey, subject to correction.
(*) Less than 15 years in 1938-52 period. Average for 15 years nearest the base



AVAILABLE SOIL MOISTURE - ABOUT MAY 1, 1959

			F	PROFILE Total Water-		SOIL M	OISTUR in Inc	E CONTEI hes_	<u>VT</u>	Y e
Station	No.	Elev.	Depth (In.)	Holding Capacity (In.)	Date of Meas.	1959	Past	Record	Avg.	ar
		<u>CO</u>	LUMBIA	- FLATHEA	D DRAIN	IAGE				
Desert Mt.	13A2M	5600	48	dens with	4/29	11.30	9.37	8.39	_	3
Marias Pass	13A5M	5250	48	8.39	4/25	6.62	6.99	7.28	7.07	5
Spotted Bear R.S.	13B2M	3700	28		5/5	4.97	4.73	5.45	_	3
Trout Lake	13A12M	3600	48		5/4	12.30	12.78	12.38	-	3
		MI	SSOURI	- GALLATI	N DRAIM	IAGE				
College Site	11D2M	4860	50	14.48	5/1	11.91	12.34	11.35	-	3



MONTANA SNOW SURVEYS ABOUT MAY 1, 1959

					SNOW C	OVER M	EASUREME	NTS	
MISSOURI			7.	1959	77 1		ast Reco		Total
DRAINAGE BASIN AND			Date of	Snow	Water	11	Content	(in.) 15-Year	Years of
SNOW COURSE	No.	Elev.	Survey	(In.)	Content (In.)	1958	1957	Average 1938-52	Record
JEFFERSON RIVER									
(Rock-Beaverhead)									
Lakeview Canyon Lakeview Ridge (Big Hole)	11E4 11E3	6930 7400	5/4 5/4	11 7	3.6 2.5	13.2	12.2	10.5*	8
Gibbons Pass Storm Lake	13D2 13C7	7100 7780	4/29 4/30	53 38	22.4	26.5	26.0 16.4	20.6*	23 17
(Wise River) Elk Horn	13D15	8450	4/30	25	8.8	11.8	10.6	7.0*	16
MADISON RIVER									
Hebgen Norris Basin Twenty-One Mile W. Yellowstone	11E5 10E2 11E6 11E7	6550 7500 7150 6700	4/30 4/29 5/1 4/30	12 13 31 6	4.3 4.9 12.3 2.0	8.9 7.7 14.4 5.0	12.4 8.1 21.5 10.8	2.6 5.4* 11.8 3.6	26 8 22 25
GALLATIN RIVER									
Devil's Slide Hood Meadow Twenty-One Mile	10D4 10D3 11E6	8100 6600 7150	5/2 5/2 5/1	75 22 31	30.6 7.9 12.3	26.6 10.4 14.4	24.6 9.6 21.5	22.0 4.3 11.8	24 24 22
MISSOURI RIVER MAI	N STEM								Windows Committee of the Committee of th
Chessman Res. King's Hill Pipestone Pass Stemple Pass Tenmile, Lower Tenmile, Middle Tenmile, Upper (Marias River)	1205 1001 12D1 12C1 12C2 12C3 12C4	6200 7950 7200 6900 6250 6800 8000	4/30 5/1 5/1 5/1 5/3 5/2 5/2	7 48 11 37 7 29 39	2.5 17.6 3.2 13.4 2.3 9.2 14.6	4.8 14.6 10.4 13.4 6.7 13.4 18.5	3.1 13.4 5.2 9.5 6.6 11.9 15.1	1.6 12.7* 2.2* 6.8* 2.0 6.9 10.4	23 18 19 24 23 24 23
Marias Pass	13A5	5250	4/29	50	21.4	15.5	17.0	9.9	24
UPPER YELLOWSTONE									
Canyon Cooke City Lake Camp Lupine	10E3 10D7 10E4 10E1	7500 7400 7850 7300	5/1 4/30 4/30 4/29	34 20 23 21	11.8 6.7 6.5 7.1	14.3 7.8 9.4 7.4	17.3 8.2 9.3 8.9	12.0** 6.2** 8.7** 8.8**	12 14 13 8

^{*}Less than 15 years in 1938-52 period. Average for 15 years nearest the base period. **Average for period of record.



MONTANA & WYOMING SNOW SURVEYS ABOUT MAY 1, 1959

					SNOW C	OVER M	EASUREMEI	NTS	
MISSOURI				1959			ast Reco		Total
DRAINAGE BASIN AND			Date of	Snow Depth	Water Content	1	Content	(In.) 15-Year	Years of
SNOW COURSE	No.	Elev.	Survey	(In.)	(In.)	1958	1957	Average 1938-52	Record
,			HUDSON	BAY DR	AINAGE				
ST. MARY BASIN					e y più la proprie				
Iceberg Lake Josephine Lake #9 Mount Allen Piegan Pass #6 Ptarmigan #8	13A3 13A14 13A7 13A6 13A8	5750 4900 5700 6250 6000	5/1 4/30 4/30 4/30 5/1	72 49 118 49 98	33.5 20.3 54.6 20.3 46.6	26.4 15.8 44.3 37.8 34.6	26.2 19.6 48.3 41.3 39.1	19.7 20.1** 39.9 29.5 29.7	37 4 37 37 22
			W	YOMING	The state of the s				
LOWER YELLOWSTONE	- Clark	's Fork				evidents experienced dispersion			To the company of the
Lodgepole	9E1	8200	5/1	32	10.9	9.2	12.6	9.5*	19
LOWER YELLOWSTONE	- Wind	River			And depart of the second deficiency of	acondo: 144 - genistra			
Big Warm Burroughs Creek Dinwoodie Dry Creek Dunoir Geyser Creek Little Warm Sheridan R. S. #2 T-Cross Ranch #Togwotee Pass	9F12 9F4 9F10 9F9 9F6 9F7 9F8 9F14 9F3 10F9	8800 8800 10000 9500 8750 8500 9500 7500 8000 9600	4/25 4/26 4/27 4/28 4/25 4/25 4/25 4/26 5/1	24 41 45 28 21 17 57 9 8 78	7.5 14.3 12.7 7.0 6.5 5.4 17.4 0.5 2.7 33.2	4.7 10.8 10.8 5.9 5.2 4.1 16.6 2.7 1.9 29.4	11.8 15.7 16.4 10.4 10.7 10.2 23.9 8.0 7.4 32.7	- 15.8** 15.4** 8.3** 7.4* 6.6** 21.0** - 4.6* 34.3**	10 10 17 10 10 4 16

^{*} Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.

** Average for period of record.

Adjacent Basin.



WYOMING SNOW SURVEYS ABOUT MAY 1, 1959

MISSOURI				1050	SNOW C		EASUREME		Total
DRAINAGE BASIN			Date	1959 Snow	Water		ast Recor Content		Years
AND SNOW COURSE	No.	Elev.	of Survey		Content		1957	15-Year Average 1938-52	of
LOWER YELLOWSTONE	- Popo	Agie Ri	.ver						
Blue Ridge Bruce's Camp Hobbs Park Mosquito Park R.S. Sawmill Glade South Pass St. Lawrence R.S. Trout Creek	5G1 8G3	9500 6500 10000 9500 8500 9000 9000 8400	5/2 5/2 4/29 4/29 5/2 5/2 4/28 4/29	23 0 53 23 10 23 20 10	7.0 0 6.5 6.6 2.9 7.4 5.6 2.9	12.2 N.R. 16.4 9.0 9.4 11.4 5.6 6.1	15.3 22.7 13.9 11.6 19.0 11.4 10.4	12.5* 22.4** 8.3** 6.8* 14.6* 7.6* 3.2**	14 19 19 15
LOWER YELLOWSTONE	- Owl	Creek				And descriptions of the second			
Beavers Mill Owl Creek	9F2 8F1	8900 8700	4/28 4/28	21 25	7.0 6.5	N.R. 9.0	9.4 8.2	8.3 7.6**	7 10
LOWER YELLOWSTONE	- Grey	bull Riv	er						
Timber Creek #2 Wood River	9 E 3 9F15	8800 8000	4/26 4/27	8 15	3.5 4.8	6.8 7.0	9.0		4 4
LOWER YELLOWSTONE	- Shosl	hone Riv	er			e de l'altre de l'altr	C. San and		
Carter Mountain East Entrance Sylvan Pass #Togwotee Pass	9E4 10E6 10E5 10F9	7800 7000 7100 9600	4/25 4/29 4/29 5/1	17 14 34 78	4.5 6.1 13.2 33.2	9.6 7.8 12.6 29.4	12.7 10.2 15.1 32.7	8.8 * 34.3**	2 5 17 10
LOWER YELLOWSTONE	- Nowo	od Creek					P mayor daying to		
Cold Springs Camp Medicine Lodge Lk. Munkres Pass Onion Gulch West Tensleep Lake Tensleep R.S. Tyrell R.S.	7E25 7E24 7E8 7E27 7E26 7E7 7E35	8700 9500 9700 8100 9075 8300 8300	5/3 5/3 4/30 4/30 4/29 4/29 4/29	30 49 40 39 49 29 39	11.7	7.2 11.8 12.2 10.3 11.7 7.4 9.0	6.1 11.4 8.2 1.9 N.R.	9.8** 4.5	3 2 8 3 2 23 2

^{*}Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.

**Average for period of record.

#Adjacent Basin.



WYOMING SNOW SURVEYS ABOUT MAY 1, 1959

MISSOURI DRAINAGE BASIN			Date	1959 Snow	SNOW C	OVER MEASUREMENTS Past Record Water Content (In.)			Total Years
AND SNOW COURSE	No. Elev.	Elev.	of Survey		Content (In.)		1957	15-Year	of
LOWER YELLOWSTONE	- Shell	l Creek							
Bald Mountain Beaver-Tongue Div. Bone-Spring Div. Granite Cr. Camp Granite Pass Ranger Creek Shell Creek	7E21 7E20 7E18 7E22 7E17 7E4 7E23	9600 9200 9200 7800 8950 8800 9600	4/25 4/24 4/27 5/1 4/27 5/1 5/1	85 78 73 T. 67 35 59	30.9 29.8 23.8 22.5 12.2 18.3	19.9 17.0 20.3 1.5 20.3 8.2 15.2	23.5 19.3 19.8 0 19.9 9.2 15.6	6.4*	3 3 3 3 3 22 3
LOWER YELLOWSTONE	- Porci	upine Cr	eek						
Five Springs Falls Medicine Wheel	7E31 7E30	7500 9000	4/30 4/25	33 70	12.0 25.9	7.2 14.8	5.6 16.3		3 3
LOWER YELLOWSTONE - Tongue River									
Beaver-Tongue Div. Big Goose #2 Bone-Spring Div. Burgess R.S. #2 Dome Lake #2 Gloom Creek Granite Pass Sibley Lake Sucker Creek Steamboat Point Wood Rock G.S.	7E20 7E32 7E18 7E33 7E34 7E14 7E17 7E11 7E12 7E10 7E13	9200 7700 9200 7900 8800 9300 8950 8000 9000 7500 8500	4/24 4/29 4/27 4/25 4/30 4/26 4/27 4/28 4/26 4/28 4/26	78 31 73 40 41 60 67 47 56 41 48	29.8 9.0 23.8 12.6 12.0 19.8 22.5 14.4 19.0 13.6 15.1	17.0 12.3 20.3 6.2 13.5 16.9 20.3 12.6 14.9 12.5 10.7	19.3 11.3 19.8 8.4 13.7 16.0 19.9 10.9 15.3 11.0 15.2		343433333333
LOWER YELLOWSTONE			demokratika internativa ilikuwa kata kata kata kata kata kata kata ka						
Muddy Creek G.S. Munkres Pass Onion Gulch Soldier Park Sour Dough	7E28 7E8 7E27 7E5 7E6	7800 9700 8100 8700 8500	4/30 4/30 4/30 5/1 5/2	13 40 39 27 24	3.6 11.7 12.5 7.5 7.3	5.7 12.2 10.3 10.8 10.5	3.6 11.4 8.2 6.6 10.4	9.8** 5.9** 5.4*	3

^{*}Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.
**Average for period of record.



MONTANA SNOW SURVEYS ABOUT MAY 1, 1959

			SNOW COVER MEASUREMENTS						
COLUMBIA			D 1	1959	**	Past Record Water Content (In.)			Total
DRAINAGE BASIN AND			Date of	Snow	Water Content		Content	15-Year	Years of
SNOW COURSE	No.	Date	Survey	(In.)	(In.)	1958	1957	Average	1
	1,00		Duz voj	(4220)	()	2,,,0		1938-52	
KOOTENAI RIVER (above Libby, Montana)									
Baree Creek	15B11	5500	4/29	103	52.0	48.1	46.6	48.6**	3
Baree Mountain	15B1	6000	4/29	116	53.6	42.9	45.6	40.6	22
Brush Creek	14A4 Can	5000 2900	4/30 4/29	30	12.0 22.3	T. 16.4	11.8	8.7**	15 13
Ferguson Fernie	Can	3500	4/28	49 0	0	0	0	3.2**	13
Gray Creek	Can	5100	4/28	54	19.3	17.5	21.5	20.3**	1
Kimberley	Can	3800	4/29	Ö	0	0.7	0	0.7**	3
Marble Canyon	Can	5000	5/4	49	16.8	12.3	14.2	13.6**	12
New Fernie	Can	4100	4/28	Patcl		0	0	8.8**	8
Red Mountain Sandon	15A1	6000	4/29 5/1	51	20.7 6.6	21.5	18.8	15.9 8.6**	22
Sinclair Pass	Can Can	3500 4500	5/1	14 4	0.7	0	5.3 1.9	3.0**	9
Smith Creek	16A1	4800	4/29	99	46.3	48.7	43.2	37.3*	20
Sullivan Mine	Can	5100	4/29	31	13.0	13.5	12.1	11.5**)
Weasel Divide	14A7	5450	4/28	89	37.0	34.0	32.6	32.7*	20
FLATHEAD RIVER									All Marie Committee and Commit
Basin Creek	13B14A	5000	4/30	0	0	т.	0	2.1**	8
Big Creek	13B3	6750	4/30	136	65.4	56.4	48.1	46.4**	10
Brush Creek	14A4	5000	4/30	30	12.0	T.	11.8	8.7**	15
Coyote Hill Desert Mountain	13B10	4200 5600	5/1 4/29	6	2.1	1.4	0.7	2.2** 9.6	12
Hell Roaring Div.	13A2 14A3	5700	4/27	39 88	16.5 39.3	15.8 32.4	15.0 30.6	28.0*	22
Holbrook	13B13A	4530	4/30	0	0	0	0	1.5**	3
Logan Creek	14A5	4300	4/30	8	2.2	0	6.9	1.6*	20
Marias Pass	13A5M		4/29	50	21.4	15.5	17.0	9.9	24
N. Fork Jocko	13B7	6330	5/1	125	62.4	51.7	42.8	41.8**	11
Spotted Bear Mt.	13B2M	7000				11.2	9.4	12.2**	8
Strawberry Lake	13A10	6500				47.3	42.9	41.9**	10
Trinkus Lake Trout Lake	13B1 13A12M	6500 3600				48.1	42.0 6.4	42.2**	10
Twin Creeks	13B11	35 8 0				7.) T.	0	1.3**	8
Upper Holland	13B5	7000				36.5	34.2	36.5**	8
Weasel Divide	14A7	5450	4/28	89	37	34.0	32.6	31.2*	20
							i		ı

^{*}Less than 15 years in 1938-52 period. Average for 15 years nearest the base period. **Average for period of record.



MONTANA SNOW SURVEYS ABOUT MAY 1, 1959

			SNOW COVER MEASUREMENTS								
COLUMBIA		1959		Pa	Total						
DRAINAGE BASIN			Date	Snow			Content		Years		
AND SNOW COURSE	No.	Date	of Survey	Depth (In.)	Content (In.)	1958	1957	15-Year Average 1938-52	of Record		
CLARK FORK											
Baree Creek Baree Mountain Chessman Res. Coyote Hill Fish Lake Airstrip Freezeout Summit Hoodoo Creek Lubrecht For. #6 N. Fork Jocko Pipestone Pass Smith Creek Stemple Pass Storm Lake Tenmile, Lower Tenmile, Middle Tenmile, Upper TV Mountain #49 Meadows #Lookout	15B11 15B1 12C5 13B10 15C2 15B10 15C1 13C8 13B7 12D1 16A1 12C1 13C7 12C2 12C3 12C4 14B1 15B3 15B2	5500 6000 6200 4200 5000 6800 6200 5400 6330 7200 4800 6900 7780 6250 6800 8000 6800 5000 5250	4/29 4/29 4/30 5/1 4/30 5/4 5/1 5/1 4/29 5/1 4/30 5/2 5/2 5/3 4/30	103 116 7 6 95 87 119 0 125 11 99 37 38 7 29 39 61 62 77	52.0 53.6 2.1 40.6 37.1 62.4 46.3 13.4 15.3 9.6 24.6 25.8 34.6	48.1 42.9 4.4 41.7 36.2 51.4 47.4 21.7 13.4 21.5 21.5 31.5 38.4	46.6 45.6 3.1 0.7 42.9 36.2 51.0 42.8 5.2 43.5 16.4 6.9 15.1 21.1 28.4 35.3	48.6** 40.6** 1.6 2.2** 31.5** 43.4* 41.8** 2.3** 41.0 6.9 10.4 21.8** 22.1*	3 22 23 12 3 17 16 7 11 19 20 24 17 23 24 23 3 17 22		
BITTERROOT											
Gibbons Pass Nezperce Camp Nezperce Pass #Lolo Pass #Powell R. S.	13D2 14D2 14D1 14C5 14C6	7100 5580 6575 5230 4230	4/29 4/30 4/30 4/29 4/29	53 23 26 70 0	22.4 9.8 11.6 32.2 0	26.5 14.1 17.1 31.1	26.0 11.5 11.7 33.8	20.6* 5.5* 10.2* 25. 5*	23 20 21 19		

^{*}Less than 15 years in 1938-52 period. Average for 15 years nearest the base period. **Average for period of record. #Adjacent Basin.



STATUS OF RESERVOIR STORAGE May 1, 1959

BASIN		USABLE	LE USABLE STORAGE - 1000 ACRE FEET							
&		CAPACITY		1		1938-52				
STREAM	RESERVOIR	1000 A.F.	1959	1958	1957	AVG.	YRS.			
MISSOURI RIVER BA	ASIN - MONTANA									
Beaverhead	Lima	84.0	40.6	50.9	15.2	59.9*	18			
Madison River	Hebgen Lake	345.0	181.2	167.8	175.7	234.0	23			
Madison River	Ennis Lake	41.0	37.3	33.0	37.5	32.6	23			
Hyalite Creek	Middle Creek	8.0	4.8	4.5	3.7	4.6**	7			
Missouri River	Canyon Ferry	2043.0	1925.0	1831.0	1478.0	1353.0**	5			
Missouri River	Hauser Lake			Toward & Pariston						
	& Lk. Helena	62.5	50.4	52.9	62.5	42.1*	19			
Missouri River	Lake Helena	10.4	6.5	7.2	10.4	5.1**	13			
Missouri River	Holter Lake	81.9	49.1	71.9	12.6	55.2	21			
N.Fk. Sun River	Gibson	105.0	73.2	39.4	46.1	73.0	23			
N.Fk. Sun River	Willow Creek	32.3	28.7	24.0	24.5	14.1	23			
N.Fk. Sun River	Pishkun	32.0	19.2	17.0	19.0	18.5	23			
Marias River	Tiber	1316.0	638.3	674.9	578.7	i	3			
Birch Creek	Swift	30.0	30.2	24.7	28.7	24.9	23			
Dupuyer & Birch	Lake Francis	112.0	97.2	97.4	92.0	78.8	23			
Judith River	Ackley Lake	5.8	-	-	3.7	4.4*	19			
Missouri River	Ft. Peck 3/	19410.0	9659.0	8102.0	6372.0	11970.0*	18			
Milk River	Fresno	127.2	124.4	125.5	124.4	93.6*	18			
Milk River	Nelson	66.8	53.0	55.5	58.9	31.8	23			
W. Rosebud Cr.	Mystic Lake	20.8	1.4	3.2	3.3	2.8	23			
Tongue River	Tongue River	73.9	23.8	13.9	16.0	19.6*	18			
Swiftcurrent Cr.	Sherburne Lake	66.1	29.2	26.9	17.7	24.9	23			
MISSOURI RIVER BA	SIN - WYOMING									
Shoshone River	Buffalo Bill	440.0	11 7	106.2	97.6	266.6	2/			
Wind River	Boysen	408.6A	44.7 C 84.1	197.6	202.5	237.9**	24			
Wind River	Pilot Butte	31.6	17.9	27.7	27.7	20.9	23			
Bull Creek	Bull Lake	152.0	40.0	56.6	60.1	45.6	20			
Belle Fourche	Key Hole	190.0A		3.2	3.2	13.0**	7			
		2,0001	J. 1 mp	1	1	1				

AC Active Capacity; USBR Billings.

^{*} Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.
** Average for period of record.

^{3/} Gross contents: usable capacity less 617.0 A.F; minimum power pool 4,500 A.F.



STATUS OF RESERVOIR STORAGE May 1, 1959

BASIN		USABLE	RE FEET				
& STREAM	RESERVOIR	CAPACITY 1000 A.F.	1959	1958	1957	1938-52 AVG.	YRS.
MISSOURI RIVER BA	SIN - NORTH DAKO	<u>ΓΑ</u>					
Heart River Heart River Missouri River James River	Heart Butte Dickinson Garrison Lake Jamestown	54.8AC 4.3AC 13805.0AC 20.0AC	67.5 5.5 4051.4 1.9	63.1 5.7 4502.0 4.9	50.6 5.1 1102.5 15.0	66.2** 5.4** -	9 8 4 2
MISSOURI RIVER BA	SIN - SOUTH DAKO						
Belle Fourche Cheyenne River Cheyenne River Grand River Missouri River Missouri River Missouri River Cheyenne River	Belle Fourche Angostura Deerfield Shadehill Ft. Randall Gavins Point Oahe Pactola	185.0AC 160.0AC 15.1AC 84.0AC 4900.0AC 385.0AC Total 55.0AC	63.9 9.6 82.8 3010.2 234.3 696.0 20.7	98.8 68.8 12.2 152.8 2830.5 243.7	62.5 40.1 9.2 82.4 2132.5 225.7	- 12.8** 148.4** - - -	33664202
COLUMBIA RIVER BA	SIN - MONTANA						
Flint Creek S. Fk. Flathead Flathead River Flathead River 6/ Flathead River 7/		31.0 3500.0 1791.0 42.8 98.6	21.4 1904.0 1174.0 39.1 44.5	21.6 2276.0 722.0 36.9 24.1	16.0 1970.0 679.0 39.6 35.0	21.7* 1986.0** 981.0 25.8* 48.5*	19 5 15 18 18

^{*} Less than 15 years in 1938-52 period. Average for 15 years nearest the base period. ** Average for period of record.

^{6/} Camas Reservoirs are shown as a sum of (4) small reservoirs on the west side of Flathead Lake located on Dry Creek and Little Bitterroot River.

Mission Valley Reservoirs are shown as a sum of (8) small reservoirs located south and east of Flathead Lake. Both Camas and Mission Valley reservoirs are operated by the Indian Irrigation Service.

AC Active Storage; USBR Billings.





INDEX TO MONTANA & NORTHERN WYOMING SNOW COURSES

		11 (1) [1	721 10 2			Locati	on.												
Drainage Basin Montana and Course Name Number	Location Sec. Elev. Lat. Twp.		suring Measured	Drainage Basin Mont		Sec. Lat.	Tup.	Long.	Began	Measuring Dates	Heasured By	Drainage Basin Montand Course Name Numb		Loc Sec lav. Lat		Range Long.	Record Began	Measuring N Dates	leas ured By
JEFFERSON RIVER	MISSOURI RIVER DRAIN	AGE			MISSOURI	RIVER DE	Tita do					/may.ma		SOURI RIVE	R DRAINAGE	(cont.)			
(ROCK-BPAVERHEAD)				(UPPER TELLOWSTONE)	n. 7890	2	88	188	1937	L	1	(TONGUE RIVER cont.			501	2011	2000	0.21.5	,
Lakeview Ridge 11E3 Lakeview Canyon 11Eh Limekiln 12E2 White Pine Ridge 12E1	7400 27 143 6930 26 143 6950 5 155 8850 18 143	2W 1948 9W 1948	3,4,5 10 3,4,5 10 3,4 1 3,4 1	Camp Senia 9D Canyon 10E Cooks City 10B Crevice Mt. 10D Independence 10D	7750 77 7400 8400 6 8000	144341. 52 55 144444.	9S 9S 73	110°-24	1937 1935 1940 1936	1,2,3,4,5 1,2,3,4,5 3,4 3,4 1,2,3,4,5	6 6 2 1	Hores Trail Div. 7E Lake Geneva 7E North Tongue 7E Sibley Lake 7E Sucker Creek 7E	16 9 15 8 11 8 12 9	200 25 8000 1 8000 1 8000 1 8000 1 8000 15	52N 55N 55N 55N	90W 86W 89W 88W 87W	1956 1956 1956 1956 1956	2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5	1 1 1 1 1
(HORSE PRAIRIE)		2010		Lake Camp 10E Lupine Creek 10E Lodgmoole 9E	7300	144 - 54 1 32	56N	110°-37'	1938 1940	1,2,3,4,5 2,3,4,5	1,4	Steamboat Point 7E Wood Rock 0.S. 7E		7500 32 1500 3	SEN SUN	87W 88W	1956 1956	5, يا , 3, ي 5, يا , 3	1
Bloody Dick 13D10 Gold Stone 13D9	7600 12 63 8100 11 83	16W 1948	3,4 1 3,4 1	Lodgspole 9E (SHIELDS RIVER)							-,-	(POWDER RIVER) Myon	dng						
Lombi Pass 13E1 Terroll Crask 13D12 Trail Orack 13E2	7480 9 103 6650 14 93 7090 15 103	15W 1948 15W 1948 15W 1948	3, li 1 3, li 1 3, li 1	Porcupine 100	3 6500	10	L/N	105	1938	3,4	ı	Crazy Woman 6E Middy Creek G.S. 6E		3200 6 7800 2	1,7N 1,8N	81±N 81±N	1956 1956	2,3,4,5 2,3,4,5	1
Trail Orsek 13E2 Salway Junction 13D11	6800 27 83	15W 19h8	3,4 1	LOWER TELLOWSTONE								Munkere Pase 7E North Powder #2 7E		700 11 300 20		85W 85W	1950 1956	2,3,4,5 2,3,4,5	1
(BIG HOFF)				(WIND RIVER) Wyomin	ε							Onion Gulch 7E Soldier Park 7E	5 8	3100 31 3700 36	SIN	85W 85W	1956 1950	5, بار3, 5 2, بار3, 5	1
Big Nole Pass 13D3 Big Hole Pass-Be. 13D4	7240 28 33 6900 24 35	18W 1948	3,4 1 3,4 1	Big Warm 9F Brooks Laks #3 10F		36 23	կ2N ԱԱΝ	110A	1955 1939	2,3,4,5 2,3,4,5	1	Sour Dough 75	6 8	9500 17		8ljW	1936	2,3,4,5	1
East Boundary 13D5 Olbbons Pass 1302	6700 22 33 7100 4 23	19W 1934 1,2,	3,4 1 ,3,4,5 1,3	Burroughs Creek 9F		15 21	143N 39N	107W	1948 1948	2,3,4,5 2,3,4,5	ī	KOOTLNAI RIVER		COLUMBIA	RIVER BAS	TH			
Jainke Oreck 13D8 Miner Forke 13D6 Miner Laks 13D7	7340 25 78 7300 24 63 6720 10 63	17W 1948	3,4 1 3,4 1 3,4,5 1	Dry Creek 9F DuNoir 9F	9 9500 6 8750	3h 27	ħSN PN	108₩	1948 1940	2,3,4,5 2,3,4,5	1	Bares Creek 15B	11 5	500 é	25N	30W	1956	4,5,5	2
Miner Laks 13D7 (WISE RIVER)	6/20 10 W	10# 1949	2,412	East Fork 9F Geyssr Creek 9F	1.3 9200 7 8500	23 12	וולדו איזוין	106M 108M	1956 1948	2,3,4,5 2,3,4,5	1	Bares Mountain 15B Red Mountain 15A	1 6	000 1	25N	31W 29W	1937 1937	4,5,55 3,4,5,55	2
Anderson Mdw. 13D1b	7000 18 35	12W 1948	3,4 1	Little Mara 9F Sheridan B.S. #1 9F	5 7500	24 3	41H 42N 42N	109W 109W	1948 1939 1955	2,3,4,5	1	Weasel Divide 14A	.7 5	1,50	א75	24₩	1955	4,5,5	1,2
Elk Norn 13D15 Wiss River 13D13	8450 15 48 6300 15 28		3,4,5 3 3,4 1	T-Groes Ranch 9F		1 29	LIN LIN	107W 110W	1940	5, يا , 3, لا, 5 2, يا , 5 2 عال 5	1 1 11	Basin Creek 13B		000 13	19N	12¥	1951	2,3,4,5	2
(RUBY RIVEN)				Togrotee Pase 10F		29	LLD.		2730	2,3,4,5	11	Big Creek 13B Brush Creek 14A	4 5	000 1		18W 26W	1941 1937	3,4,5 3,4,5	1,2
Flashlight 12D3	6950 22 BS	7W 1945	3,4,5 1	(POPO AGIE RIVER) Blue Ridge 80	Wyoming 2 9500	23	31.N	101W	1939	2,3,4,5	1	Cattle Queen 13A Desert Mountain 13A	2M 5	700 (600 21)		17W 19W 22W	1939 1937 1942	3,4,5 1,2,3,4,5	6 1,2
HADISON RIVER				Bruce's Camp 80 Nobb'e Park 90	5 6500	2L 22	32N 2S	101W 3W	1955 1948	2,3,4 2,3,4,5	1	Hell Roaring Div. LLA Holbrook 13B Kiehenehn 1LA	134 L	5770 35 530 18 886 11	21N	13W 22W	1951	3,4,5 1,2,3,4,5 4,5	1,2 2
Hobgon 11E5	6550 22 113	3E 1934 1,2,	,3,4,5 3	Mosquito Park B.S. 90 Sawmill Glade 80	4 9500	23 3	2S 31N	3W 101W	1940 1939	2,3,4,5	1	Logan Creek 11A Marias Pase 13A	5 4	300 31 250 31	30N	2կ\ 1կ\	1937 1934	3,4,5	2
West Yellowstone 11E7 Norris Daain 10E2	6700 34 138	5E 1934 1,2,	3,4,5 3,4 6	South Pase 80 St. Lawrence 9F	3 9000 11 9000	13 26	30N 1N	101W	1939 1940	2,3,4,5 2,3,4,5	1	Mineral Cresk 13A Quintonkon 13A	16	1000 2	35N	17W 17W	1957 1951	3,4,5 2,3,4,5	6
				Trout Creek 90 (OWL CREEK) Wyoming		5	2S	2₩	1948	2,3,4,5	1	Spotted Bear Mt. 138 Strawberry Lake 13A	10 6	000 2 500 1	28N	15₩ 19₩	1948 1948	3,4,5 3,4,5	1,2
				Beavere Mill 9F		6 36	43N 43N	102W 101W	1948 1948	2,3,4,5	1	Trinkus Lake 13B Trout Lake 13A	12H 3	500 9 600 2	28N	17W 17W	1948 1948	3,4,5 3,4,5	2 1,2
GALLATIN RIVER Devil's Slids 10Db	8100 1h 5S	4F 3027 0	215	Owl Creek 8F (GREYBULL RIVER) Wy		96	יוכט	101#	1740	2,3,4,5	1	Twin Cresks 13B Upper Holland Ik. 13B		7000 2		16₩ 16₩	1951 1948	5, بار3, 2 5, بار3	1,2
Devil's Slids	8100 14 55 6600 22 45 6700 24 35	6E 1935 2,	.3,4,5 2,1 .3,4,5 2,1 .3,4,5 7	Timber Creek #1 9E		25-	L7N	103W	1948	2,3,4,5	1	CLARK PORK Baree Creek 158	11 9	500 6	25N	30W	1956	4,5,5	2
21-Mile 11E6	7150 1 118	arm and a	3,4,5	Timber Creek #2 9E Wood River #1 9F	3 8800	25 28	1.7N	103W 103W	1955 1939	2,3,4,5 2,3,4,5	1	Baree Mountain 15B Coyote Nill 13B	1 6	200 12	25N	31W 16W	1937 1952	1,2,3,4,5	2 2
MISSOURL RIVER MAIN STEM					15 8000	28	116N	103W	1956	2,3,4,5	1	El Dorado Mine 13C Fred Burr Pass 13C	11 8	800 2 3000 1	6N	12¥ 13¥	1949 1957	4 3,4,5	1
Chassman Reservoir 1205	6200 2 8N		3,4,5 3	(SHOSRONE RIVER) Wy			ros:	20011	2019	20215	,	Freezeout Summit 15B Gold Creek Lk. 13C	10 7	200 1	8N	27W 12W	1937 1949	4,5 4	1
Crystal Laks 901 Grasshoppsr 1002 Kings Hill 1001	6100 19 12N 7000 19 9N 7950 35 13N	8E 1938	3,4 1,2 3,4 2	East Entrance 10E Sylvan Pass 10E		17 12	52N 52N	109W 110W	1948 1936	1,2,3,4,5	6	Hoodoo Creek 150 Intergaard 130 Lubrecht Forest #6 130	4 6	5200 5450 400 11	5N	27₩ 13₩ 15₩	1937 1936 1951	5ريا يار3ر2 کيا د د د	ا ل 12
Picnic Grounds 1206 Pipratone Pass 1201	6500 10 SN 7200 11 1N	6W 1941 2,	3,4,5 3 ,3,4 4 ,3,4,5 1	(NOWOOO CREEK) Wyom	ing							North Fork Jocko 138		5330		17W	1941	1,2,3,4,5 3,4,5	5
Stample Page 1201 Ten Mils Crosk L 1202	6900 16 13N 6250 13 8N	7W 1934	3,4,5 3	Cold Springs Camp 7E Medicine Lodge Lks 7E		1 7	50N 51N	88W 87W	1956 1956	2,3,4,5 2,3,4,5	1	Pipestone Pase 12D Red Lion 13C		7200 10		7₩ 13₩	1938 1958	2,3,4,5 3,4,5	1
Ten Mile Groek M 12G3 Ten Mile Groek U 12Ch	6800 13 8N 8000 19 8N	6W 1934 1,2,	3,4,5 3,4,5 3	Munkers Pass 7E North Powder 7E		11	1.8N 1.7N	85W 85W	1950 1956	2,3,4,5 2,3,4,5	1	Slide Rock Mt. 13C Southern Cross 13C		7100 35 500 1	10N 5N	16W 13W	1937 1936	2,3,4	1 4
(TETON RIVER)					26 9075	31 33	48N Son	85W 86W	1956 1956	2,3,4,5 2,3,4,5	1	Stemple Pase 12C Storm Laks 13C	7 7	5900 16 7780 15	L N	7W 13W	1934 1939	3,4,5 2,3,4	3
Freight Creek 12Al Waldron Creek 12B2	6000 13 26N 5600 16 25N	10W 1948 9W 1948	3,4 1 3,4 1	Tensleep R.S. 7E Tyroll R.S. 7E	7 8300 35 8300	30 30	49N	86W 86W	1935 1956	2,3,4,5 2,3,4,5	1	Stuart Mill 13C Stuart Mountain 13C TV Mountain 1LB	1 7	5500 19 7400 (5800 3)	1 Lin	13W 18W 19W	1936 1936 1956	2,3,4	1,2
West Fork 12B1	6000 6 25N		3,4 1	(SHELL CREEK) Wyomi	ng							TV Mountain BITTERSEOT RIVER East Fork R.S. 13D		J ₄ 00 1		17₩	1937	1,2,3,4,5	1
(SUN RIVER)					21 9600 20 9200	33 12	56N 55N	91W 91W	1956 1956	2,3,4,5 2,3,4,5	1	Cibbons Pass 13D Lolo Pass 1LC	2 7	100 L	25	19¥ 158	1934	1,2,3,4,5 3,4,5,5	3,1
Benchmark 1288 Cabin Creak 1286	5500 9 20N 5400 33 23N	10¥ 1949	3,4 1 3,4 1,2	Bons-Spring Div. 7E Granite Creek Camp 7E	18 9200 22 7800	32 15	55N 53N	89W 89W	1956 1956	2,3,4,5	1	Nez Perce Camp 1LD Nez Perce Pass 1LD	2 5	5580 19 5575 33	&20 LS 28N	23W 17E	1937 1937	3,4,5	1
5-Bull 1289 Oatee Park 1285 Coat Mountain 1287	5600 36 20N 5300 31 24N	10W 1949	3,4 1,2 3,4 1,2	Horse-Trail Div. 7E	17 8950 19 9200	19 29	54n 55n	88W 90W	1956 1956	2,3,4,5 2,3,4,5	1	Powell R.S. 140 Skalkaho Summit 130		1230 3: 1259 3 :		14E 17W	1956 1937	3,4,5,52	2
Gost Mountain 1287 Wrong Ridge 1283 Wrong Gresk 1284	7000 20 21N 6800 17 25N 5700 32 25N	10W 1949	3,4 3,3 1,2 1,2	Ranger Creak 7E Shell Creek 7E	8800 23 9600	32 12	53N 52N	88W 88W	1935 1956	2,3,4,5 2,3,4,5	1			SASKATO	HEWAN RIVE	R BASIN			
(MARIAS RIVER)	J, 000 32 23N	1747	3,4 1,2	(PORCUPINE CREEK)	goming							ST. MARY RIVER							
Marias Pass 13ASM	5250 34 30N	1hW 1934 1,2,	3 5, بار3		7500 30 9000	19	56N	92W	1956	2,3,4,5	1	lcsberg Lake #3 13A Josephins Upper 13A		600 48°-		1130-431	1922 1956	5	3,9
(MILA RIVER)				(TONGUE RIVER) Wyon		24	56N	92¥	1956	2,3,4,5		Josephine Lower #9 13A Mount Allen #7 13A	يا بلاد 7 5	900 48°-	47' 46'	113°-41	1955 1922	5	3,9
Rooky Boy 9A1	5200 15 28N	168 1941	3,4 7	Beaver Tongue Div. 78	20 9200	12	55N	91₩	1956	2,3,4,5	1 .	Piegan #6 13A Ptarmigan #8 13A		800 LB0		1130-山1 1130-山1	1 1922	5 5	3,9 3,9
(MUSSELSHELL RIVER)					7700 32 7700	fi fi	53N 53N	86W 86W	1935 1955	2,3,4,5 2,3,4,5	1								
Grasehopper 10C2	7000 19 9N	85 1938	3,4 2	Burgase B.S. #1 71		32 36	55N 56N	89W 89W	1956 1950	2,3,4,5 2,3,4,5	1	a. Numerals 1,2,3,4 an	d 5 refs	r to Janua	ry 1, Pabr	uary 1, F	arch 1,	oril 1 and May	y 1.
				Domo Lake #1 7E	7900 33 8800 334 8800	36 11 11	56N 53N	89¥ 87₩	1955 1950	2,3,4,5	1 1	b. Numerals refer to A	gency th	at secure	the enow	зштеў ая	follows		
				Cloom Creak 71	9300 311, 9300	11 32 19	53N 55N	87₩ 87₩	1950 1956	2,3,4,5 2,3,4,5 2,3,4,5	1	1. Soil Concervation S. 2. U.S. Forest Service	8			8. C	ity of Bo	periment Stati ozeman	
					-,,0	47	5LN	88W	1956	2,5,10,10		 O. S. Geological Su Montana Power Compa 	rvey ny			9. D	ominion w	later & Power B and Wildlife	Service
com ato tenner a ator 1150												5. U. S. Indian Servic 6. National Park Servi			Moisture al Marker			au of Reclamat ate Forestry S	
																	5 P-11	LRL COM_LE	3(3)

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* JUN 2 - 1959

UNITED STATES DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

Box 855 Bozeman, Montana U. S. DEPARTMENT OF AGRICULTURE

MONTANA SNOW SURVEY DATA - MAY 15, 1959

Following are snow survey measurements made on or about May 15, 1959 in the Kootenai River basin in northwestern Montana:

COLUMBIA DRAINAGE BASIN AND SNOW COURSE	No.	Elev.	Date of Survey		SNOW Co Water Content (In.)	Pater Water	EASUREME ast Reco Content 1957	rd (In.) 15-Year	Years of Record
KOOTENAI RIVER									
Baree Creek Baree Mountain Red Mountain Weasel Divide Sullivan Mine	15B11 15B1 15A1 14A7 Can	5500 6000 6000 5450 5100	5/15 5/15 5/14 5/15 5/15	90 108 42 72 21	47.4 54.0 18.8 32.3 9.6	32.8 35.6 13.5 24.5 T.	27.7 36.0 9.0 22.9	- 48.5** 19.6** 32.2** 7.2**	3 8 7 8 6

Following are snow survey data for the Flathead basin for insertion (page 14) in the May 1, 1959 Snow Survey and Water Supply Forecasts bulletin:

FLATHEAD RIVER

Spotted Bear Mt.	13B2M	7000	5/4	34	13.8	11.2	9.4	12.2**	8
Strawberry Lake	13A10	6500	5/1	98	44.3	47.3	42.9	41.9**	10
Trinkus Lake	13B1	6500	5/2	126	58.8	48.1	42.0	42.2**	10
Trout Lake	13A12M	3600	5/4	10	3.6	3.3	6.4	8.8**	11
Twin Creeks	13B11	3580	5/4	0	0	Τ.	0	1.3**	8
Upper Holland Lk.	13B5	7000	5/1	110	50.8	36.5	34.2	36.5**	8

^{**}Average for period of record.



Agencies Cooperating in Collecting Data Contained in this Bulletin

- U. S. Forest Service Region I, Missoula, Montana
- U. S. Geological Survey Helena, Montana
- U. S. Army Corps of Engineers Portland, Oregon Seattle, Washington Omaha, Nebraska Riverdale, N. D.
- U. S. Indian Irrigation Service St. Ignatius, Montana
- U. S. Weather Bureau Helena, Montana
- U. S. Fish & Wildlife Service Red Rock Lakes Refuge Monida, Montana
- U. S. Bureau of Reclamation Billings, Montana Boise, Idaho
- Montana Power Company Butte, Montana
- City of Bozeman Bozeman, Montana
- Bonneville Power Administration Portland, Oregon

- National Park Service Yellowstone National Park Glacier National Park
- Montana Experiment Station Montana State College Bozeman, Montana
- Agricultural Experiment Station North Montana Branch Station Havre, Montana
- Montana State School of Forestry Montana State University Missoula, Montana
- Soil Conservation Service Montana, Wyoming, Idaho
- Soil Conservation Districts
 Montana Counties
- Johnson Flying Service, Inc. Missoula, Montana
- Water Rights Branch
 Dept. of Lands & Forests
 Victoria, British Columbia
- Department of Northern Affairs & National Resources Calgary, Alberta

Federal - State - Private COOPERATIVE SNOW SURVEYS

Furnishes the basic data necessary for forecasting water supply for irrigation, domestic and municipal water supply, hydro-electric power generation, navigation, mining and industry

"WATER IS THE WEST'S GREATEST RESOURCE"